Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

CONFIDENTIAL

Office Memorandum • UNITED STATES GOVERNMENT

TO : Chief, Engineering Division, OS DATE: 8 March 1955

ATTN :

FROM : Chief, Contract Branch, OL/PD

SUBJECT: Potential Task 6, Contract

50X1

50X1

50X1

50X1

1. Pursuant to the request contained in memorandum from your office dated 18 February 1955, inclosed is proposal covering potential Task 6 under Contract

2. If the technical aspects of the Contractor's proposal, as well as the estimated cost thereof, meets with your approval, please submit your requisition for the amount required to cover the proposed work.

3. The original of the Contractor's proposal has been retained in the files of this office.

50X1

Encl

OL/PD/CB/WKH:wkh (8 Mar 55)

Distribution:
Orig & 1 - Addressee
1 - File
1 - Chrono

CONFIDENTIAL

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

CONFIDENTIAL

50X1

[redacted]

February 24, 1955
3637

50X1

[redacted]

Washington 13, D. C.

Attention: [redacted] 50X1

Dear Sir:

Re: Additional Work, Contract [redacted] 50X1

Transmitted herewith is our proposal for an additional task on contract [redacted] per oral request of [redacted] The scope of work has been reviewed during recent conferences between your representatives and our engineers, and Attachment I to this letter proposal sets forth our technical proposal for such work. 50X1

We are also enclosing our Price Analysis in Attachment II. The rates set out by notes (1), (2), (3), and (4) are based upon the twelve month averages according to our financial statements for the calendar year 1954. The monthly rates are as follows:

1954	Senior Engineering(1)	Junior Engineer, Asst., etc. (2)	Overhead (3)	Genl & Admin. Expense (4)
Jan.	[redacted]			
Feb.				
Mar.				
Apr.				
May				
June				
July				
Aug.				
Sept.				
Oct.				
Nov.				
Dec.				
Ave.				

50X1

Our proposal is based on the salary ranges enclosed.

CONFIDENTIAL

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

[redacted] 50X1

[redacted] February 24, 1955 50X1

3637

We would like to suggest that reimbursement for travel expenses be on the basis of actual cost for transportation, or $.07 per mile when travel is by privately owned conveyance, and $17.00 per diem for subsistence. Such is the arrangement on our most recent contract with you; namely [redacted] 50X1

With Task V of contract [redacted] rapidly nearing completion, it appears that time is very important. We would be pleased to be called upon to assist you in any way in your appraisal of this proposal. 50X1

Very truly yours,

[redacted] 50X1

JFK/vtd [redacted] 50X1

Encls:
1) Att I, Tech Prop, 8 pg, (dupl)
2) Att II, Price Analysis, 1 pg (dupl)
3) Job Class and Salary Ranges dd 2/24/55 (dupl)

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

[redacted] 50X1

Attachment I
to [redacted] 50X1

February 24, 1955

[redacted] 50X1 proposes to develop, design and evaluate a system for radio location following in general the system as proposed in the attachment hereto. The proposed plan of attack is discussed below:

PROBLEM

To evaluate a proposed system for radio location. This task will be concluded with the submission of a final report, setting forth the findings of the Contractor. The principle of this system is the determination of the bearing of a radio station by the simultaneous reception of signals from this station at three controlled sites. Bearings will be determined by the simultaneous recording of a signal at the three sites, and by measuring the time difference of reception of the same signal element at the three positions.

SPECIAL CONDITIONS

Phase 1

1. [redacted] 50X1 in conjunction with the properly designated Technical Representative of the Contracting Agency, proposes to plan, lay out and design an initial system in detail, including the preparation of a complete bill of materials. Such equipments as may require changes or modifications will be listed. Such equipments as may have to be developed, designed and constructed will be listed. It is clearly understood that the work as outlined under this paragraph will require an appreciable amount of engineering design. We will submit, not later than the fifth of each month, a progress report summarizing the work done during the preceding month.

2. A cost estimate of all the materials listed on the bill of materials which will be completed under paragraph 1. will be prepared and upon approval by the Government of this list of equipment, the required equipment will be purchased, modified, or built.

Phase 2

1. The equipment will be assembled and tested at our field station [redacted] 50X1 While in the Contractor's plant, all necessary delay measurements will be made on the equipment prior to its installation. A "Closed circuit" test of all equipment functioning as a three-station system will be performed. Operating procedures and an overall check of the system are to be obtained from this specific test.

SECRET

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

[redacted] 50X1

Attachment I

[redacted]

February 24, 1955 50X1

Phase 2 (con't)

2. [redacted] will assume responsibility for installing the equipment to insure that it is in correct operating condition and that all three sites are operating identically. This is a prime requisite of the evaluation proceedings. These three sites are located in the Washington area, the Contractor's plant, and in the vicinity of [redacted] respectively. 50X1 50X1

3. On completion of the installation phase of this evaluation, [redacted] will operate the [redacted] site in this test set-up. Government personnel will operate the equipment at the two remaining sites. 50X1

4. [redacted] will be responsible for special maintenance of the system. 50X1

5. [redacted] will provide consulting services throughout the duration of this evaluation since it is anticipated that changes and/or modifications of the equipment or the method of operation of the system may be found desirable.

6. Close cooperation with the Technical Representative will be maintained during this work. Monthly progress reports will be prepared as previously mentioned.

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

50X1

50X1

PROPOSED SYSTEM FOR RADIO LOCATION

GENERAL

The proposed system for radio location consists of three parts. The first part is a method of receiving the signal that is to be located. This would consist of normal antennas and radio receivers, etc. The received signal will be displayed on one half of a double beam oscilloscope. The second part of the system is the method for alerting the out stations so that they will be operating against the same target at the same time. This system can consist of a radio circuit, a land line, or the public mail, whichever is more suitable to the problem at hand. The third part of the system is the timing circuit. It is the function of this circuit to provide a common, comparable marker interval system for comparison and timing purposes. By utilizing this portion of the system it is possible to determine the time difference of arrival of the radio signal at the various stations of the locator system.

TIMING SYSTEM

The proposed system operates in the following manner. The reference signal is generated by a frequency standard such as the General Radio frequency standard comprising two units, types 1105A and 1100AP. This standard and the associated equipment is located at the control station. The output of the frequency standard is passed through a wave shaping circuit operated by a manual gate in order to present the timing signal on demand. The wave shaping circuit renders the standard frequency shorter in rise time so that greater timing accuracy is achieved. The wave shaping circuit, thus, would limit, clip and differentiate the sine wave signal from the frequency standard, delivering a series of rather sharp pulses. These pulses would then be passed to a vacuum tube keyer which would key a C. W. radio transmitter. The wave shaper and the vacuum tube keyer equipment would normally be expected to be constructed by the contractor, and the transmitter should be purchased. A transmitter having a reserve power of about 500 to 1000 watts peak power should be adequate for the purpose, although it may be practical to operate the system with considerably less power most of the time.

Branching off from the wave shaper circuit ahead of the keyer unit is a circuit leading to a counter chronograph, specifically to the "ON" control of this counter. Depending upon the reaction of the counter chronograph to the reception of successive "ON" pulses, once it has initiated action, it may be necessary to devise circuitry to eliminate all but the first pulse of the timing wave train from the output to the counter chronograph. If this is found to be necessary, the properties of fired gas tubes, specially their low input impedance, should be helpful. Of course, the DC plate supply will furnish a manual reset feature desirable. This could be combined with the actuating gate for releasing the timing signal.

SECRET

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

[redacted]

50X1

Attachment I

[redacted]

50X1

TIMING SYSTEM (con't)

Of course, local circuitry must be provided at the control station to impress the timing wave train upon one beam of a dual beam cathode ray oscillograph.

The actuating control for the timing gate should operate in the release position after actuation. The actuate position of the control can then be used for performing two functions: (1) turning on the motors of the scope cameras, and (2) resetting the lockout on the local counter chronograph "ON" circuit successive pulse eliminator. This, then, would set up the equipment to receive the actuate signal.

At the "OUT" station the timing signal is delivered to the dual beam oscilloscope the same as at the control station. The timing signal is also delivered to a successive pulse eliminator circuit, with a manual reset, thence to a keyer tube to a transmitter similar to the one transmitting the timing signal. This transmitter could undoubtedly be smaller in capacity than the one at the control station because of the smaller duty cycle. This single pulse that is transmitted back to the control station is used to turn off the counter chronograph. The function of the successive pulse lockout circuit at the out station is to keep the out station off the air as much as possible. In this manner they do not transmit a train of pulses, only a single pulse at random intervals. The manual reset also provides another function of the system. It can indicate to the control station operator the fact that the out station operator, for some reason or other, is not able to cooperate in this particular operation. This is indicated at the control station by failure of the chronograph to shut off. This is a fail safe feature of the system, since, in any event, no information can be extracted from the system if one of the counter chronographs fails to indicate.

CAMERA CONTROL

It is anticipated that the camera recording system for this radio locator would be the Dumont type 321 Camera on Dumont dual beam scopes. Various simple systems can be utilized to turn on the camera's motor, such as a resonant reed relay at the out station and a tone generator at the control station. The cameras must be provided with a timer which will allow them to run for a definite interval of time and then shut off.

[redacted]

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

50X1

50X1

UNDETERMINED DESIGN FACTORS

Certain factors are best determined during the course of this evaluation, or in the initial set-up when the complete equipment becomes available. One of the chief of these factors is the frequency of the timing signal to be transmitted. Another closely related factor is the speed and length of film run out during any one individual shot. The value and variability of the delays which the timing signal will encounter in the equipment itself is unknown and must be determined prior to attempted operation. The power actually required for the transmitters must be determined.

OUTLINE

I. Receiving the Signal

a) normal antennas and receivers

b) received signal displayed on 1/? dual beam oscilloscope

II. Method of Alerting the Out-stations

a) radio circuit, land lines, public mail

III. Timing Circuit

a) provide a common, comparable marker interval system for comparison and timing purposes

b) by utilizing this portion of the system, it is possible to determine the time difference of arrival of the radio signal at various stations of the system.

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

50X1

Attachment I

50X1

TIMING SYSTEM

Master - Control Station

1. Reference signal is generated by a G. R. frequency standard.

2. Output frequency passed through a wave shaping circuit.

   a) shortens rise time so that greater timing accuracy is achieved.
   b) limits, clips, differentiates the sine-wave -- gives a series of rather sharp pulses.

3. Wave shaping circuit operated by manual gate.

   a) other contacts on this gate switch can be used to turn on scope camera motors and reset all controls necessary to start operation.

4. Pulses to a vacuum tube keyer to key a CW radio transmitter.

5. Output of wave shaper through the gate also goes to counter chronograph - to "ON" channel.

   a) may be necessary to devise circuitry to eliminate all but first pulse.

   b) manual reset of chronograph may be coupled with manual gate of #3.

6. Shaped wave through the gate -- goes to one beam of the oscilloscope.

"Out" Stations

1. Timing signal from microwave receiver is fed to one beam of dual beam oscilloscope.

   a) timing signal also fed to successive pulse eliminator circuit, with manual reset, and then to keyer tube of transmitter.

   b) single pulse transmitted back to the control station is used to turn off the chronograph. If for some reason an "out" station cannot cooperate in a bearing, he transmits no pulse back to "control".

2. Camera control

   a) A system of turning on camera is suggested - a tone generator at control station when turned on closes a vibrating reed relay at each location. It is suggested that camera be set to run a predetermined time ad then shut off.

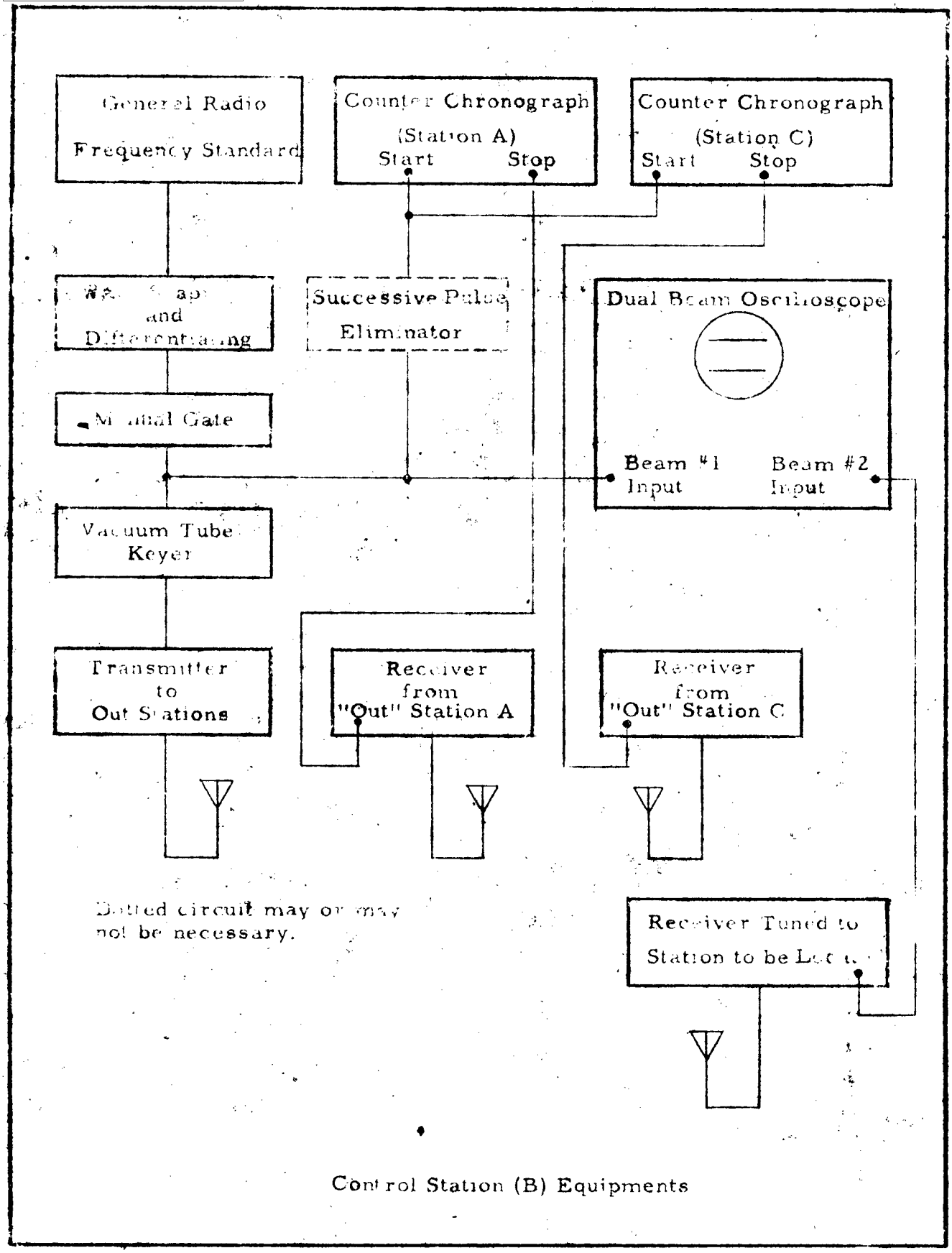
Undetermined Factors

1. Frequency of the timing signal to be transmitted.
2. Speed and length of film used per shot.
3. Value and variability of the delay which timing signal will encounter.

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

50X1



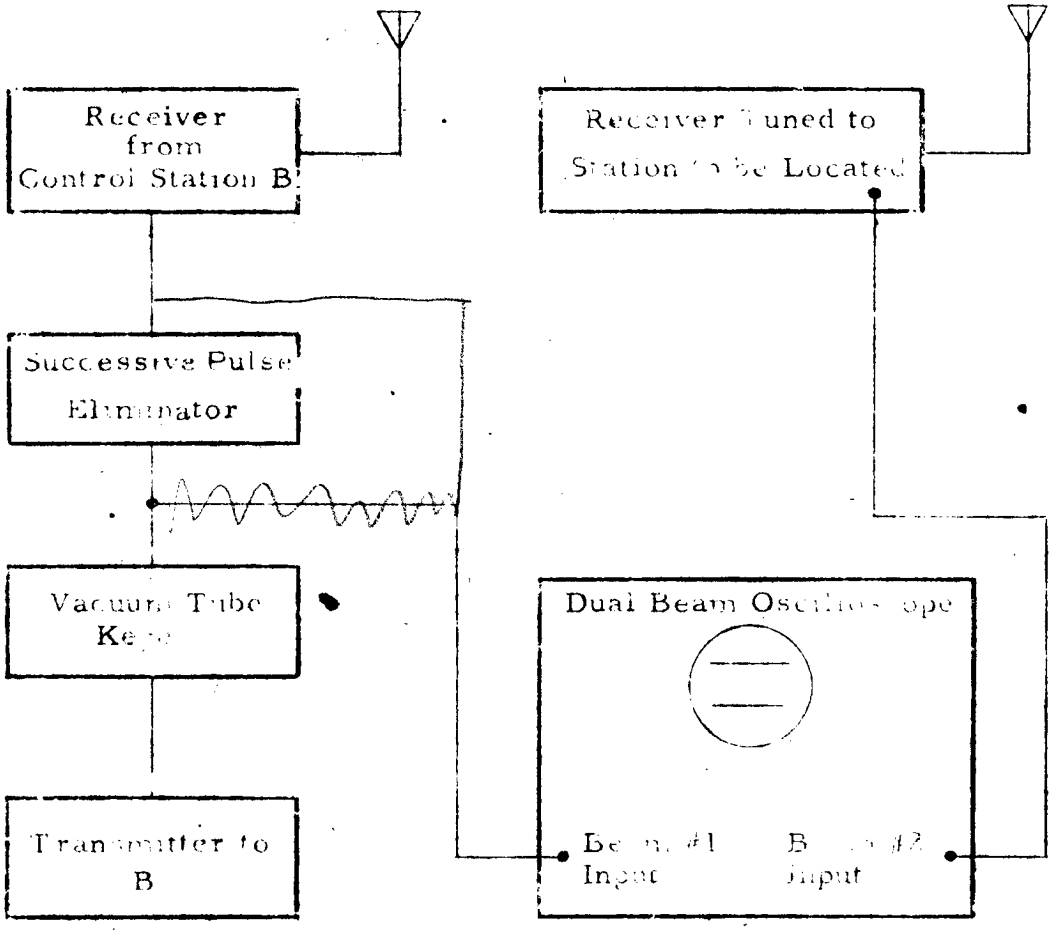
Control Station (B) Equipments

[redacted]

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

50X1



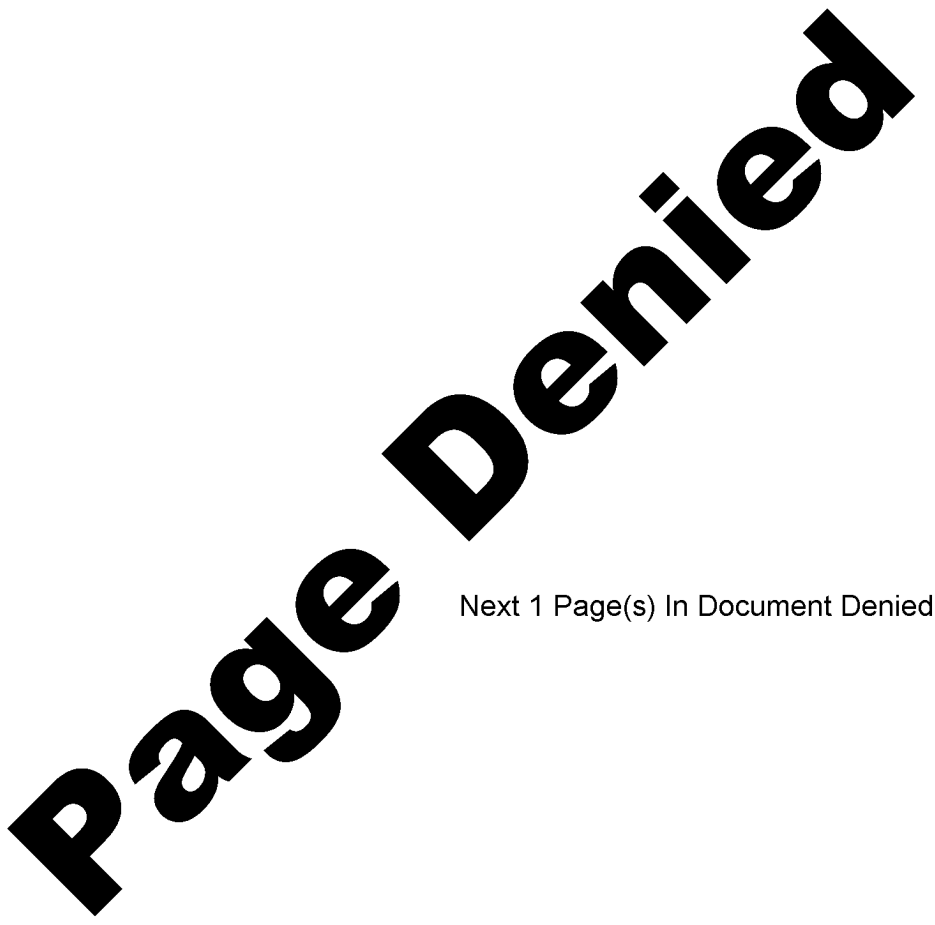
Out stations A and C are identical except for the frequency which is used to transmit back to B.

Oscillo-record cameras are used at all the stations to record data on moving film.

Out Station A and C Equipments

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5

50X1
Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5



Next 1 Page(s) In Document Denied

Declassified in Part - Sanitized Copy Approved for Release 2014/01/15 : CIA-RDP78-03424A001300090023-5